

### **Remarks**

1. Referring to the rejection of claim 14 under 35 U.S.C. §112, the Examiner will note that claim 14 has been cancelled.
2. Referring to the rejection of claims 1, 18 and 24 under 35 U.S.C. §112 regarding the inclusion of the term “more directly connected”, it will be noted that each of these claims has been amended to replace this term with the term “connected closer in the communications network”. It is respectfully submitted that one skilled in the art would inherently understand from the content of the present application as filed that the middlebox identity-providing node of the present invention is connected closer in the communications network to the entities associated with the middleboxes than the middlebox control node. Support for this amendment can be found in the drawings and can also be found in the fact that, in exemplary embodiments of the invention, a middlebox identity-providing node may comprises a middlebox itself, a user terminal (entity associated with a middlebox) or a gateway connected between the middlebox control node and the entities.
3. Referring to the rejection of claims 1, 18, 24 and 25 under 35 U.S.C. §112 regarding the inclusion of the term “to control said first middlebox”, it will be noted that this term has been augmented in claims 1 and 18 to read as “to enable said middlebox control node to control said first middlebox”. However, the objected to term could not be found by the applicant in either of claims 24 and 25 although these claims have been amended to deal with other objections.
4. Claims 25 and 27 have been amended in a manner that is believed to address the 35 U.S.C. §112 rejection of claims 25 to 28.

5. Claims 21 and 22 have been amended to recite “a propagated signal comprising data representing....” by way of addressing the 35 U.S.C. §101 rejection of these claims.

6. The present invention resides in the recognition that it is not necessary to have a middlebox control node for controlling a plurality of middleboxes in a communications network maintain current information about all the middleboxes and which address realms they are associated with in the manner of prior art systems. In the present invention, the responsibility for storing/discovering the identities of middleboxes and providing such information when needed to the middlebox control node is devolved to middlebox identity-providing nodes. The middlebox identity-providing nodes may comprise the middleboxes themselves suitably imbued with identity providing functionality, user terminals (entities) associated with the middleboxes or nodes such as gateways connected between the middlebox control node and the user terminals. As such, the present invention provides a network which is much more flexible than the prior art systems since the middlebox identity information provided to the middlebox control node is provided as and when needed by other nodes and therefore is more likely to be current than when such information is preconfigured and stored in the middlebox control node itself.

7. The Examiner has rejected all of the main independent claims of the present application under 35 U.S.C. §103(a) as being unpatentable over Schuster et al (US6822957 in view of Huitema and Handley. The Examiner will be aware that in *ex parte* examination of patent applications, the Patent and Trademark Office bears the burden of establishing a *prima facie* case of obviousness. MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent and Trademark Office. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984). Only when a *prima facie*

case of obviousness is established does the burden shift to the applicant to produce evidence of nonobviousness. MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). If the Patent and Trademark Office does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of a patent. *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985). A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. MPEP § 2142.

8. Taking claim 1 of the present application, the Examiner contends that Schuster discloses all of the limitations of this claim save for a middlebox device in the network, this missing feature being found in Huitema. From the Examiner's analysis of Schuster, it is noted that items 26, 30, 40 and 44 (most of which are shown in figure 1) comprise a NAT identity-providing node and item 18 a NAT control node. It is quite clear therefore that the NAT control node (item 18) is connected closer in the communications network to the entities such as user terminal (telephone) 22 than the identity-providing node which is the converse of the arrangement of the present invention. So, if the Examiner's analysis of Schuster is accepted, which it is not for reasons as will be explained below, it is completely at

odds in at least one important respect to that of the present invention as defined by claim 1. There is nothing in either of Huitema or Handley which would motivate one skilled in the art to reverse the connections of NAT identity-providing node and NAT control node as disclosed in Schuster. Consequently, the combination of Schuster and Huitema (and indeed Handley) cannot disclose all of the claims limitations of claim 1.

9. Notwithstanding the submission in section 7 of this response, the applicants consider that the Examiner's analysis of Schuster has been conducted with the aid of hindsight as a means of establishing the 35 U.S.C. §103(a) rejection of the independent claims of the present application. The use of hindsight is improper and rejections formulated by such a process are not permissible. In the present application, a middlebox is defined as a node connected between two address realms and an address realm is defined as a region of a communications network in which each of the entities in that region have an address or an identifier that is unique within that region. Throughout the specification of the present application, reference is made time and again to the fact that a network address translator (NAT) is one example of a middlebox. One would therefore have expected the Examiner to conclude that router 26 (figure 1) of Schuster is a middlebox particularly since it comprises a NAT. However, if the Examiner had drawn this obvious conclusion, his analysis of the relevance of Schuster to the present invention as presented in the Office Action would fall apart. It can therefore be reasonably concluded that hindsight played a part in the Examiner avoiding so obvious a conclusion.

10. Under any reasonable interpretation, the router 26 of Schuster comprises a middlebox. However, taking this forward, what Schuster does not then disclose are i) a middlebox-identity-providing node and ii) a middlebox control node. A middlebox control node is a node for controlling a plurality of middleboxes in a communications network. The applicant concedes that, while Schuster does not explicitly disclose a middlebox control node or discuss its function, such a control node is implicitly

present in the network depicted by figure 1 of this reference. Schuster does not explicitly discuss the provision of a middlebox control node, however, since such control node operates entirely in accordance with the prior art system whereby the control node maintains preconfigured information for all of the middleboxes of the network. Consequently, the system of Schuster does not disclose nor require middlebox identity-providing nodes as defined by the present invention.

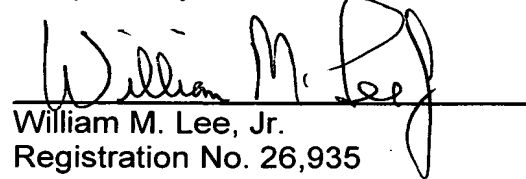
11. Schuster does not disclose any middlebox identity-providing nodes contrary to the Examiner's claim that it does. Those parts of Schuster at columns 19, 18 and 23 referred to by the Examiner as basis for the disclosure of a NAT identity-providing node discloses no such thing. What is discussed is the implementation of distributed network address translation (DNAT) in a communications network whereby a device (telephone) in a first network requests from a second device (router 26) in the same network at least one locally unique port which it combines with a common external network address for the first network to create a combination network address that identifies the first network device for communication with a second network device located in a second network. The use of a combination network address reduces the network translation burden on the NAT router 26 in the first network. This improved network address translation process of Schuster is performed at the local network level and has no impact on the operation of the middlebox control node in the system of Schuster which operates in a manner according to the prior art system acknowledged in applicant's patent application. Neither of Huitema nor Handley disclose a middlebox identity-providing node that is separate from the middlebox control node and so the combination of these references does not teach all of the claims limitations of claim 1.

12. The submissions presented in sections 7 to 11 of this response are equally applicable to remaining independent claims as presently pending.

13. In view of the foregoing, it is respectfully submitted that this application is now in condition for allowance, and such action is solicited.

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Respectfully submitted

A handwritten signature in black ink, appearing to read "William M. Lee, Jr.", is written over a horizontal line.

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